

### 3.036 Predictions with Linear Models

1. A cannery processed 605 pounds of strawberries in 3.5 hours. The cannery processed 2100 pounds in 10 hours. How many pounds of strawberries can be processed in 12 hours?
2. The table shows winning times in the 400-meter run.

Year	1968	1972	1976	1980	1984	1988	1992	1996	2000
Seconds	43.86	44.66	44.26	44.60	44.27	43.87	43.50	43.49	43.84

- a. What is the linear model for the data?
- b. What is the correlation coefficient?
- c. According to the linear model, what should the winning time be in 2005?
- d. According to the linear model, in what year would the winning time had been 48 seconds?

For questions #3 – 4 find a linear model for each function. Then use your model to estimate the following:

- a. The value of  $y$  when  $x = 7$
- b. The value of  $y$  when  $x = -3$
- c. The value of  $x$  when  $y = 15$
- d. The value of  $x$  when  $y = 8.7$

3.

$x$	0	2	4	6	8	10
$y$	25	21	20	23	19	17

4.

$x$	0	2	4	6	8	10
$y$	3.1	4.2	4.3	4.4	5.1	6.7

5. A candle is 10 in. tall after burning for 2 hours. After 3 hours, it is  $8\frac{1}{2}$  in. tall. Predict how tall the candle will be after burning 6 hours.

6. The table shows the average monthly Social Security benefits from 1940 – 1999.

Year	1940	1950	1960	1970	1980	1990	1999
Amount (in dollars)	22.71	29.03	81.73	123.82	321.10	550.50	757.71

- A. What is the line of best fit for the data?
- B. Predict how much a retired worked in 2005 would receive from his/her Social Security.
- C. In what year should we expected to see benefits or \$1,000?